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INTONATION IN THEORY AND PRACTICE OF GREEK AND TURKISH MUSIC

by Iannis Zannos

Introduction

Though the Christian Greek orthodox and the Islamic Ottoman cultures were rivals on a political and ideological level throughout the existence of the Ottoman empire, the Greek orthodox population of the empire like the Armenians, the Jews and other ethnic groups participated in a common musical culture. The musical cooperation and exchange of all these groups resulted in a musical "lingua franca". Even now, common characteristics are evident in the musics of these nations of the Balkans and Near East that were once under Ottoman rule. The music of the Greek orthodox church, a vital element in the culture of the eastern Roman empire before it was conquered by the Turks, survived with the Church and continued to develop in subsequent centuries. It is difficult to trace the mutual influences that inevitably took place during the centuries of coexistence of Turkish and Greek music. But it is certain that especially from the 17th century onwards, Ottoman court music became increasingly recognized as a complement to Greek orthodox church music. This was a time that witnessed an impressive regeneration of the so called "post-Byzantine" music, culminating in a bloom of creativity in the 18th century. Numerous theoretical treatises and musical anthologies of religious and secular pieces testify to the significance for Greek church musicians of Ottoman music, as an important source for musical education, technique and inspiration. It was valued above all as an instrumental counterpart to the purely vocal church music, musical instruments permitting a tangible and empirical definition of musical phenomena that cannot be realized using the voice alone.

In recent years, Greek musicians and music students have begun to rediscover Turkish music and to visit Turkey to come in closer contact with it and study it under Turkish masters. Musicological research is now faced more than ever with the challenge of clarifying the theoretical framework of the mutual exchange between the two musical cultures that existed up to the 19th century and that still persists up to now in popular music. A combination of historical, comparative, analytical and systematic approaches is necessary. In this paper I shall concentrate on a characteristic and important aspect of Greek and Turkish music, namely that of intonation. My purpose is to show that the comparative study of Greek and Turkish music not only uncovers their close relationship, but can also aid our understanding of the Greek and Turkish modal systems, especially as regards intonation and melodic structure.

Both Greek orthodox church music and Ottoman court music (now called "Turkish classical music", "*Klasik Türk Musikisi*") have the human voice as their model or basis. This is as evident today in the notation and terminology of Greek music and in the style of Turkish music, as it was in the writings of important music theorists and philosophers centuries

ago, such as Al-Farabi and Ibn Sina. For these modern practitioners and ancient theorists alike, vocal music is the most perfect of musical species; other species are judged according to the degree in which they imitate or partake of the qualities of vocal music. Without pressing this point any further here, let it be said that the ability of the human voice to produce minute pitch differences or "shades" in intonation is a sublimely expressive feature which Near Eastern instrumentalists strive to attain on most instruments. Perennial discussions of theorists on the right definition of the intervals of different modes (Greek: *ichoi*, Turkish: *makamlar*) show how important this feature is. The mathematical definition of intervals was well known as the basis of the theoretical discipline of harmonics. Often, criticism and doubts were voiced by scholars and musicians, to the effect that the discipline of harmonics remains on the level of theoretical speculation and bears no relevance to actual musical practice. Yet if ancient Greek and medieval theorists are to be taken "with a grain of salt", so also is the claim that they are not relevant to practice at all (see also Vogel 1963: 25-57). I am suggesting here that, from a contemporary standpoint, theory should be regarded as an integral part of musical tradition, and its relationship to other kinds of historical or contemporary evidence about musical practice should be carefully examined. An example of fundamental research for such comparisons is the work of Owen Wright, The Tonal System of Arab and Persian Music A.D. 1250-1300 (Wright 1978).

In the 19th and 20th century, within the general framework of cultural changes and crises in traditional arts, music theory underwent radical reforms in both Greece and Turkey. Once more, the subject of the definition of intervals—that is of correct intonation—was taken up, and several proposals were made. None of them offers a perfect solution; even more, none of them can be said to correspond with contemporary empirical study, in the current more advanced state of physical measurement and mathematical modelling. Here I shall outline the theoretical systems currently in use in Greece and Turkey, and compare some of their features to the older music theory and to contemporary practice in these musical traditions.

Basic Characteristics of Modern Greek Music Theory

Modern Greek music theory can be said to begin with Chrysanthos, Archbishop of Madyta, author of the notation and theory that is used in Greek church music today (see also: Morgan 1971). His system, expounded in "Theoritikon Mega tis Mousikis" ("Great Theoretical Treatise on Music", Chrysanthos 1832), is based on the then existing theory and notation, but also draws on his knowledge of ancient Greek, Turkish, and western European music and music theory. All major subsequent contributions are based on Chrysanthos' fundamental reform of theory and notation.

The significance of the Chrysanthine reform must be understood in the context of the theory of Greek church music at his time. The most important trait of this theoretical tradition, especially as regards intonation, is the absence of any reference to musical instruments. Musical instruments

were banished from church because of their connections with secular events and pagan cult rites. With the exception of some isolated examples from the 17th century onwards, no diagrams or descriptions derived from musical instruments appear ever to have been in use. In addition, not once are intervals defined mathematically as ratios of string-lengths on a stringed instrument. It seems as if all teaching was done by ear. On the other hand, it is certain that many educated church musicians also played musical instruments and one may suspect that instruments did play a role in musical education that could not be admitted in writing (see numerous biographies of musicians in: Papadopoulos 1890; among the prominent examples are Petros Pelloponisios (18th century) and Chrysanthos (18th-19th century)). The absence of any concrete descriptions of intervals makes the reconstruction of early Greek modes before Chrysanthos (early 19th century) even more difficult than that of the Turkish, Persian and Arabic ones.

The reform of Chrysanthos was immediately adopted by the Patriarchate, and the complete church repertoire transcribed in his notation, so that today only this notation is in use. Nevertheless revisions of his theory were necessary, to update his description of intervals and also to add minor features in notation. There were numerous such efforts in the course of the 19th and 20th century, of which two require special attention: The report of the "Music Commission of the Patriarchate" (Music Commission 1888), on which current textbooks and teaching is based, and the work of Simon Karas, as summarized in his two volume "Theoritikon" (Karas 1982) which contains a more detailed and comprehensive description of the *ichoi.*

Relative vs. Scale-degree Bound Mode Description

In contrast to Turkish music theory, Greek music theory lacks the concept of a "universal" fixed scale containing all degrees used in practice ("Materialleiter"); as explained above, it is not based on an instrument of reference but on the voice. This vocally based, traditional system of church music theory and notation may be called "modular" and "relational", that is, it is based on the combination of small modules—collections of 2 to 4 or 5 degrees—whose internal intervallic relationships are easy to memorize and to intone. The most common type of such a module is the tetrachord, but also trichords (3 notes—two intervals) and pentachords (five notes) are used (Figure 1). This system is reflected in the notation and nomenclature of degrees. Two or more pitches within one octave may have the same name or sign. Furthermore, different occurrences of one and the same pitch may bear a different name or sign, depending on the melodic context.

The relational principle is well suited to intonation, which is naturally relational. The ancient Greek *"Systema Teleion"*, which functioned as a Generalleiter, a background general scale, left vague traces in cloudy notions of Greek church music theory (the *"teleia foni"* of the *ison*, the number of the *tonoi*). Smaller units, transposable on any pitch, were preferred in practice. Absolute pitch plays no role in Greek church music,

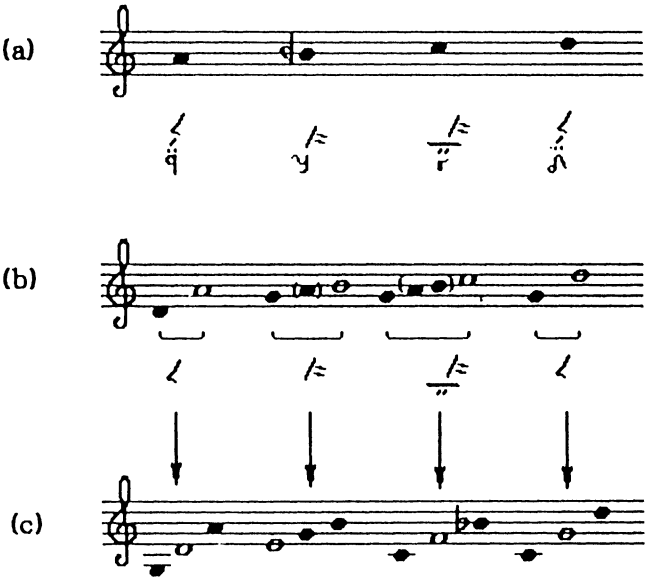


Figure 1:

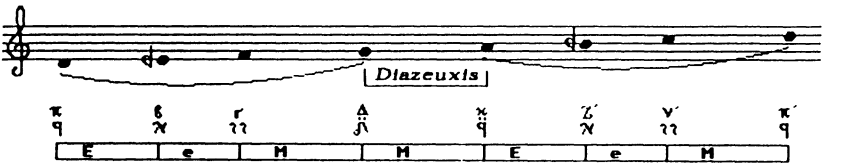
The four main martyriai, resting on the four degrees of a tetrachord

The degree signs are based on the letters α,β,γ,δ (=1, 2, 3, 4). Additionally, there are interval signs, whose corresponding interval coincides with the main tonal space of the modes.

a) shows the usual location of the main tones of the modes in the old system
b) shows the main tonal spaces as indicated by the interval signs, and as observed in melodic structure.
c) In recent times (mainly 19th century, but also earlier), the modes were transposed a fifth lower.

yet musicians were well aware of the shifts in relative pitch that occur when transposing interval structures on different degrees in the course of repeated modulations, as a remark by Gabriil Hieromonachos in the 15th century shows (Gabriil 1938:203). The relational principle also has the advantage of not being limited to a fixed number of degrees, thus allowing the transposition of any sequence of intervals to any degree of any other sequence. On the other hand, it can often be difficult to interpret in its pure form, because of the absence of any general framework of reference. In order to provide such a framework, Chrysanthos introduced a degree nomenclature extending over three octaves. It is based on the seven first letters of the Greek alphabet (*pa*-alpha, *vou*-beta, *ga*-gamma, *di*-delta, *ke*-epsilon, *zo*-zita, *ni*-ita), and used in conjunction with a modified version of the old relative degree signs (Figure 2). There are no fixed degrees with their own names other than these seven diatonic degrees. Instead, intermediate pitches are described simply as alterations of the diatonic degrees. To give an approximate idea of the size of intervals, Chrysanthos expressed them in terms of his own "smallest unit" of measurement, which

is 1/68th of the octave. Theoretically, the pitches a degree can take are only limited by the division into 68 units. The Music Commission of the Patriarchate redefined the basic intervals and scales of Greek music using a division of the octave into 72 equal parts. The reason for this choice is



e=elachistos tonos (smallest tone)
E=elasson tonos (smaller tone)
M=meizon tonos (major tone, 9/8, 204 cents)

Figure 2:
The diatonic martyriai of the modern Greek system.

not difficult to guess: The Music Commission followed Aristoxenos, and adopted his division of the wholetone into 12 equal parts, 12 being the common denominator of 2, 3, and 4, necessary to express the half, the third and the fourth of the wholetone as multiples of a fraction. The differences which resulted from this new basis are not pertinent to the present discussion.

Summarizing, it may be said that the relative system of pitch definition of Greek church music, although complex, maintained remnants of ancient Greek tetrachordal thought and adapted them to church music. The free and often inconsistent usage of degree and modulation signs indicates that many concepts were unclear or loosely defined, and became meaningful only in the context of the directly transmitted oral tradition. Research has yet to show whether there are any systematic schools of notational conventions discernible in the manuscripts.

Species and Shades

Led by his knowledge of both ancient Greek and Byzantine music theory, Chrysanthos attempted to apply the ancient Greek theory of genera and shades *(chroai)* onto the scales of the church modes. This theory still persisted to a certain extent in Persian, Arabic and Turkish music, but Chrysanthos had also a strong ideological motive in trying to reintroduce it in Greek music, namely providing a link with ancient Greek music. If the three genera of ancient Greek music—the diatonic, the harmonic and the enharmonic—could be applied to church music, then it could be that the latter was a direct descendant of the former. So argued Greek musicologists in the course of long heated discussions centering around the "greekdom" of Greek church music (see Papadopoulos 1890: 278f. and 444-449, on Misail Misailidis). As is explained below, this kind of strongly ideologically motivated thinking created a biased conception of the modes:

in some important cases, definitions of scales were adopted, whose correspondence to the real sound characteristics of actual modes in practice is dubious. This is an example of ideological bias exerting an influence on music theory, and thus effectively on music education and practice. Yet it is also true that some basic ancient Greek concepts of intervals had never become completely obsolete in the theory of church music, even though its theoretical apparatus was not sufficient to explain them clearly.

When Chrysanthos assigned to each of the existing church modes *(ichoi)* one of the ancient Greek species of the octave, he took several factors into account: first their audible characteristics, second their correspondences to Turkish modes *(makam)* and third the fragmentary and dispersed evidence found in manuscripts of church music theory, which was probably also still alive as orally transmitted theoretical tradition at his time. Thus he assigned the first *ichos* to the diatonic genus, as it obviously does not contain any intervals larger than the whole tone. His definition of the basic diatonic scale—the scale of the first *ichos*—(Chrysanthos 1832: 95-98) is identical to that of a scale first found in Al-Farabi in the tenth century. Al-Farabi himself testifies that this scale was widely used (s. Al-Farabi: 46, 50, 268-273 and Manik 1969: 46). As pointed out by d'Erlanger (Erlanger 1949: 48-56), this scale is derived from a very simple type of diatonic scale (Figure 3). The species on which the latter is based is first mentioned by Ptolemy, who again counts it amongst the most commonly

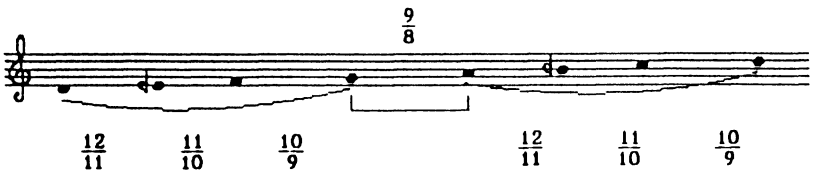


Figure 3:
The diatonon homalon as basis of the ancient bayati mode, according to D'Erlanger (1949:51).

used species in his times (Ptolemaios: 38-40). Chrysanthos and the Music Commission of the Patriarchate describe the modern derivative of this species as containing three whole tones of different sizes: a major tone *(tonos meizon)*, a minor tone *(tonos elasson)* and a smallest tone *(tonos elachistos)*. This contrasts with the tetrachord of the third *ichoi*, that is built of two major tones and a half tone. The choice of the term *tonos elachistos* rather than *imitonion* (semitone) for the smallest tone of the first *ichoi*, may indicate that modern Greek theorists laid special emphasis in the distinction of the half tone of the Pythagoreian diatonic tetrachord of the third *ichoi* (9/8, 9/8, 256/243) and the smallest second of the "soft diatonic" tetrachord of the first *ichoi* (9/8, 88/81, 12/11, a derivative of 10/9, 11/10, 12/11, see figure 4). In this context, it is interesting to note that a short anonymous treatise of the 15th century claims the first *ichos* to be the only one to contain only "whole" and no "altered intervals" (Anonymous: 7r-7v) confusing the idea of half tones with that of altered degrees of a diatonic scale. The scale chosen by Chrysanthos is cited also

by 19th century Turkish and Arab theoreticians (Yekta 1922: 3016, Musaqa: 14, table 1).

Chrysanthos assigned the second *ichos* and its *plagios* (plagal) to the chromatic species, because they use a second which is larger than the whole tone. He also correctly observed that this interval is larger in the plagal second *(plagios devteros)* than in the authentic second *ichos (kyrios devteros)*. The two different types of interval sequences belonging to the second mode and its plagal respectively are sometimes described as different *chroai* (shades, colorings) of the chromatic species. There are no direct references to a chromatic species in church music theory before Chrysanthos.

The enharmonic species has a special position amongst the three: it is supposed to be the most difficult to master, requiring expert musicianship, and it was probably the most ancient one, serving as a foundation of the other two (Vogel 1963: 52, 54). That may also be a reason why the term *enarmonios* ("enharmonic") is mentioned in church music theory before Chrysanthos (Plousiadinos: 56r), while the diatonic and chromatic species are never explicitly mentioned. The *enarmonion melos* (enharmonic type of melody) is specifically associated with two *phthorai* (roughly: modulation signs) that have a special significance in church music theory from its early stages. They are called *nana* and *nenano*, and were also characterized as *mesoi ichoi* (medial modes) in older music theory. Other sources describe the *pthora* of *nenano* as "fine" *(lepti)*, (Greek National Library, Codex 968, fol. 181v). Almost certainly Chrysanthos was expressing this very common *topos* in music theory, when he attributed exactly to those semitones on which the signs of the *phthorai nana* and *nenano* most usually appear, the size of 3/12 of a wholetone, that is, of a quartertone. Thus, the plagal second mode and the third mode become "hybrid" or "fake" enharmonic modes, containing only one "quartertone" within each tetrachord (the tetrachord of the ancient Greek enharmonic species contains two "quartertones"). For Chrysanthos, the *nana*-third mode belongs to the enharmonic species. Later, other scholars like Misailidis (s. Papadopoulos 1890: 444-449) and Karas (1982 vol. 2: 153f.) interpreted the *nenano*-second plagal mode also as "enharmonic".

Simon Karas combined information from many different antique, medieval and modern sources, adopting or modifying whatever he felt was fit. As a result, his work bears the characteristics of a compilation while at the same time it is being held together by basic concepts. He describes a far greater variety of intervals, scales and modes than any previous Greek theoretician—with the exception of those who wrote on Turkish music.

Modern Turkish Music Theory

By "Modern Turkish Music Theory" is meant here the system that is taught today in Turkish conservatories, as well as modifications or alternatives proposed by some 20th century theorists. Today, the prevailing system is the one developed by Raouf Yekta (1922), Suphi Ezgi (1933-1953) and Sadreddin Arel. Its roots lie in the medieval Persian and

Arabic traditions and especially in that of the "systematist school" represented by Safi al-Din, Qutb al-Din and further elaborated by musicians such as Abdulkadir Meragi and al-Ladiqi.

Contemporary Turkish theory is less differentiated in its concepts of modes than in earlier periods. In particular, the concepts of *awaz* and *shubah (shuab, sohbe)* have been abandoned. These are comparable to the Greek types of *ichos*-branches (authentic, plagal, medial, para-plagal, para-medial, et al.) and to the *phthorai,* as has been partly pointed out by Kyrillos Marmarinos (1749 fol. 73r). Instead, a theory of basic *(basit),* transposed *(sed)* and combined *(birlesik) makamlar* was developed. The loss of the older concepts is a pendant to the partial abandonment of the relational principle for the description of degrees in Greek theory. Thus, both Greek and Turkish theory was simplified at the price of being impoverished. Insights on the history and nature of the two modal systems are to be expected in taking up the lead of Kyrillos in comparing those parallel—even if not identical—concepts.

The contemporary Turkish system uses exactly 24 fixed degrees within the octave, being an extension of Safi al-Din's system of 17 degrees per octave. These degrees are not tempered quartertones. They are placed at distances of commas (ca. 21 cents) and leimmas (ca. 90 cents) from each other. Using a limited number of degrees is a theoretical concession which inevitably results in disregarding certain details of intonation. As we shall see, some of these are very important. There have been attempts to improve upon this by using a greater number of degrees. Gültekin Oransay (1957) proposed 29 degrees and Ekrem Karadeniz (1981) 41 degrees per octave. One can see from this how relative the idea of a fixed degree is in both Greek and Turkish music.

Tetrachords and pentachords are also used in the modern Turkish system, but their classification does not follow the ancient Greek principle of the three species.

A Comparative Framework

The Greek and Turkish modal systems resemble each other to a very high degree, despite the fact that one is based on vocal and the other on instrumental practice. Their correspondences have been extensively described by musicians like Chalatzoglou, Kyrillos (1749), Kiltzanidis (1881) and others. Such early comparative works are as yet unexplored but immensely valuable sources of information. In a comparative study, the distinction between theoretical systems and actual musical structure is essential, as is the distinction between theory before and after the 19th century. With these distinctions in mind, several fundamental correspondences can be summarized as follows: a) There exists a one-to-one correspondence between the degrees of most simple and common diatonic scales of Greek church music and the Turkish *perde* (degrees), as well as of the non-diatonic degrees and the *nim perde,* although stated above that the Greek music theory is not scale-based, a fundamental diatonic scale can be constructed using disjunct tetrachords.

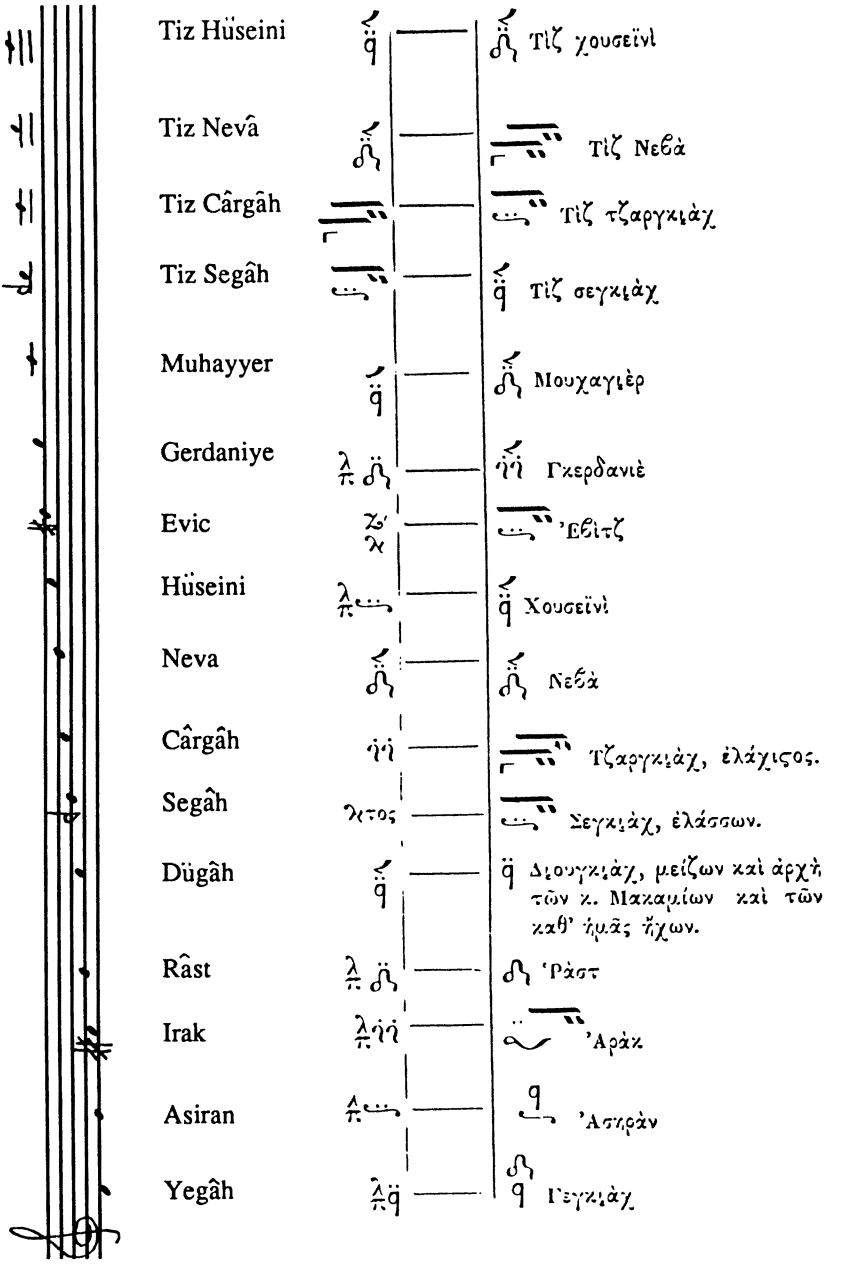


Figure 4:
The correspondences of Greek and Turkish diatonic degrees (Kiltzanidis 1881:24).

b) A correspondence of Greek and Turkish tetrachords and pentachords is also easy to establish. c) There are very close similarities between the most common *ichoi* and *makamlar.* It is not possible to confirm an absolute identity though, as both the Greek and Turkish traditions are many-layered, showing variations within each *ichos* or *makam.* Lesser or greater degrees of similarity are observed in different repertoire or historical periods.

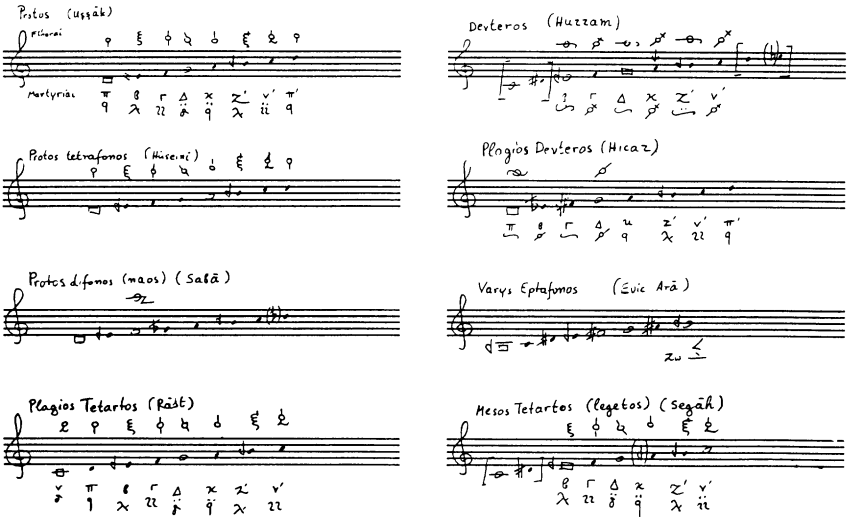


Figure 5:
Examples of ichoi, the Greek signs for their degrees, and their Turkish equivalents.

I shall not deal here with correspondences between older Turkish and Greek theoretical concepts, but only with the juxtaposition of contemporary theory and practice. Some ideas developed during recent analytical-systematic investigations of Near Eastern modal music can help bring the two systems into a common perspective. At the same time, they can aid the understanding of older traditional concepts, and show their closer affinity to the nature of the musical traditions in question.

Features of Intonation in Practice

The expressive quality of Greek and Turkish music is not only due to the use of a great variety of fixed interval sizes. As noted above, these traditions make full use of the flexibility of the voice as a melodic instrument. Thus, the interval sizes identified by music theory are constantly varied in practice by small inflections that are conscious and refined means of expression. It is therefore necessary to take into account these fluctuations in the intonation of degrees and intervals. The interval sizes given by the different theorists are only of relative significance, and it is irrelevant to dispute over the exact size of an interval; whether for example a small wholetone is exactly 8/53 of the octave or 10/72 of the

octave or has a string ratio of 10/9 or 12/11 etc. Intervals are identified and intoned not by their absolute size alone, but also by their function in a melodic context. Therefore, different sizes are acceptable or required in different contexts. Aristoxenos already expressed this need, when he talked of a *topos*, a locus, within which movable degrees can take any value:

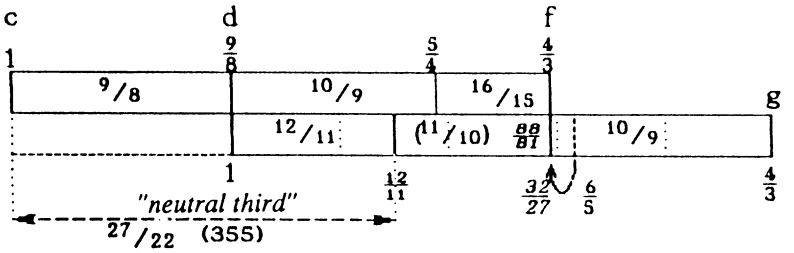
> ". . . we must regard the Lichani as infinite in number. Let the voice become stationary at any point in the locus of the Lichanus here demonstrated, and the result is a Lichanus. The point we are discussing is one of no little importance. Other musicians only dispute as to the position of the Lichanus—whether, for instance, the Lichanus in the enharmonic species is two tones removed from the mese or holds a higher position, thus assuming but one enharmonic Lichanus; we, on the other hand, not only assert that there is a plurality of Lichani in each class, but even declare that their number is infinite." (Aristoxenos: 183-184)

The basic framework that underlies the phenomena of fine intonation in both Greek and Turkish music was thus already expressed in the ancient Greek theory of tetrachords: The two outer degrees of the tetrachord are *"akinitoi"* (immovable), the two middle ones *"kinoumenoi"* (moving). That is, the outer degrees remain stable at the interval of a perfect fourth, and thus form a stable frame of reference for intonation, while the two middle degrees are the ones that change in pitch: this happens not only when there is a change from one species to another, but also according to the momentary needs of the melody or for other expressive reasons. This is already suggested by the above passage of Aristoxenos, and can be easily heard in musical practice today. Researchers like Touma (1980), Kuckertz (1970), and others have pointed out that certain degrees stand out in modal melodies as "axes" or "points of attraction". These are precisely those degrees that play the role of *"akinitoi"*, while the relative interval of neighbouring degrees to them can change. Oransay (1966: 60f., 130-136) has well documented that the stable axes of a mode do not always lie at the distance of a fourth or fifth, but can also lie at the third. Furthermore, combinations of more than two such axes form structures of wider ambitus. On this basis, I would like to make some observations on each of the three species as they are intoned today in Turkey and Greece.

1. The diatonic species

The key problem of the diatonic species is a very old one: the position of the degree *segah (vou)*. It goes back to the introduction of an extra fret for the middle finger by the 8th century Persian musician Zalzal. Medieval theorists appear to be at a loss about where exactly to put this degree, or how many of them are necessary—their opinions diverge. Today, some schools prefer a higher position, some a lower one; theorists like Karas or Ezgi take both into account, while Karadeniz gives the lower *segah* a name of its own, *"uşşak"*, after the *makam* in which it features

proslambanomenos



Combination of the diatonon homalon with a fourth based on the subtonic on which often a diatonic tetrachord with major third is played. Only the upper moving degree is modified, to make a perfect fourth with the subtonic, which results in a major tone above. The "neutral third" results from using the 12/11 small tone of the homalon, instead of the 10/9 of the tetrachord with major third.

Figure 6:
The modern "soft diatonic" tetrachord as a combination of the diatonon homalon with a fourth based on its proslambanomenos (subtonic).

most prominently. Normally, musicians use both degrees, changing from one to the other according to the needs of the melody.

A closer examination of the usage of the different inflections of *segah* reveals that from the functional point of view there are two distinct *segah* degrees: one is a third to *rast (ni)* and the other is a second to *dugah (pa)* (Figure 6.) Frequently both appear in the same melody, as it modulates between different tonal axes. When practicing musicians say that *segah* is played lower in *uşşak* or *huseini* (both based on the degree *dugah*) than in *rast* (based on *rast*), they are expressing this fact. Thus, one may say that there are two kinds of diatonic species:

a) The species of the first modes (*protoi ichoi - uşşak, huseini* and variants), is characterized by tonal spaces built primarily on the fourth *dugah* (a - d) and secondarily on the minor third *dugah - çargah* (a - c) and the fifth *dugah - huseini* (a - e). The modes of this species use *segah* (b) as an unstable upper second, that tends to become a leading note towards the fundamental, but stays mostly larger than a semitone.

b) The species of the fourth modes (*tetartoi ichoi - rast, neva* and variants), is characterized by tonal spaces built primarily on the major third *rast - segah* (g - b) or *neva - evic* (d - f#) and the fifth. In this species, the third *segah* or *eviç* tends to be a natural third 5/4 (386 cents). This is the position of *segah* according to modern Turkish theory. Greek theorists always prescribe a *vou* (= *segah*) lower than the natural third, yet it is not clear if *vou* is actually sung low even in the cases when it is a third to *ni*, or if they are being misled by the *vou* of the first modes.

2. The chromatic species

Greek theory makes a clear distinction between the chromatic tetrachord types of the second mode and its plagal (*ichos deuteros, ichos plagios deuteros*), while Turkish theory knows only one type of chromatic tetrachord. In practice though, the Turkish *makamlar hüzzam* and *hicaz*, correlated with *ichos deuteros* and *plagios deuteros*, are in fact intoned exactly like their two Greek counterparts. Instrumentalists make the distinction between these two modes by using different frets for the degrees in question, or by adjusting the number of lowered *mandal*[1] on the *kanun*. Even finer distinctions are made between other *makam* of the chromatic species. In contrast to Ezgi and the other theorists of the "official" system, Karadeniz (1981: 104, 112) does describe the difference between *hicaz* and *hüzzam*. One further ambiguity exists though, namely which of the two inner degrees of the tetrachord are higher or lower in *hüzzam* (*deuteros*) than in *hicaz* (*plagios deuteros*). I shall not attempt to resolve this problem here. Instead, I wish to point out a structural difference between the two *makam* which I believe lie at the root of their differences in intonation and character:

The basic tonal space (the interval between the main tonal axes) of the *makam hicaz/ichos plagios deuteros* is the fourth. This is repeatedly and clearly stated in Greek church music theory before Chrysanthos as well as in Greek and Turkish descriptions of the *makam hicaz*. It is also easily recognized in the melodic structure of pieces belonging to these modes. The basic tone space of *huzzam/deuteros* on the other hand, is a major third. This can again be observed in melodic structure. It is also reflected in the meaning and position of the old *martyriai* (degree signs) of this mode. The basic *martyria* often bears two additional interval signs indicating the ascent of a third. This *martyria* is also on degrees a third apart, namely on the degrees corresponding to *vou* (e - *segah*), *di* (g - *neva*) and *zo* (b - *eviç*). In conjunction with this, older theory describes *deuteros* as proceeding "*kata diphonian*", that is in thirds. That is why Chrysanthos uses only two *martyriae* and *phthorai* signs for *deuteros*, instead of the four required to denote the four degrees of a tetrachord. A scale built on modules of two intervals theoretically requires only two *martyriae*. By this example we see clearly the impact of the melodic function of the degrees of a mode on notation. What is even more remarkable, Chrysanthos constructed the scale of this mode by repeating the same intervallic frame comprising a small tone and a slightly augmented tone, at the third, three times. This totally wrong description of the intervallic structure of *deuteros* was caused by the very subtle differences between its successive intervals in conjunction with the fact that it can be intoned by pausing at every second degree, which is the natural way to emphasize the tonal axes that lie at successive conjunctive third intervals. Kyrillos (1749: fol. 12v-15v) dedicated a major part of his description of the modes to describing the differences between *deuteros* and *plagios deuteros*, in which he also talks about the third (*diphonia*) as the basis of *deuteros* (Figure 7).

15/14 (119)	7/6 (267)	16/15 (112)

1. Suphi Ezgi: Ezgi defines only one type of chromatic tetrachord, the *hicaz* tetrachord. The intervals he gives are identical to those of the *malakon chroma* of Karas

a)	11 (125)	23 (260)	10 (113)
b)	27/25 (133)	$\frac{2187}{2500}$ (232)	27/25 (133)
c)	15/14 (119)	7/6 (267)	16/15 (112)

2. The *"malakon chroma"* (soft chromatic genus), characteristic of *deuteros=hüzzam* a) Karadeniz, b) Epitropi, c) Karas. The differences are very small.

a)	8 (91)	26 (294)	10 (113)
b)	11 (125)	26 (294)	7 (79)
c)	$\frac{243}{256}$ (90)	243/200 (337)	$\frac{25}{24}$ (71
d)	$\frac{243}{256}$ (90)	32/27 294	$\frac{2187}{2048}$ (114)
e)	$\frac{31}{30}$ (57)	5/4 (386)	$\frac{32}{31}$ (55)

3. The *"skliron chroma"* (hard chromatic genus), characteristic of *plagios deuteros=hicaz*

a) Karadeniz (Sedaraban) b) Karadeniz (hicaz) c) Epitropi d) Karas 1 e) Karas 2 *(nenano)*. The variations show the difficulty of theorists to define the narrow leading tonens to the stable framework of the fourth. These degrees are by nature unstable. The two versions of Karadeniz are partly due to the different position of the tetrachords on a scale with fixed degrees. The second tetrachord of Karas shows the theory of the "enharmonic" *nenano*, mentioned in older treatises (see also Papadopoulos 1890).

Figure 7:
The chromatic genera in modern Greek and Turkish theory.

Thus, here once more, two basically different but outwardly similar modal structures were confused. Again, the particularities of their intonation can be explained on the basis of their structural difference. Since in *plagios deuteros/hicaz* the fourth is more prominent, the two degrees inside this fourth tend to be strongly attracted towards the two outer degrees, that are the stable tonal axes. As a result, the second in the middle becomes large, while the seconds at either end tend to be small. The two inner degrees are unstable, which accounts for the difficulties in defining their position exactly. In *deuteros/hüzzam*, the stable framework is the major third *di* (g - *neva*) - *zo* (b - *evic*), while the degree in the middle is inflected slightly towards the lower tone of the third, thus giving this mode its subtly sad and characteristically ambiguous and evasive mood.

In a way, it is as if the lowered second of *uşşak* were combined with the major third of *rast*.

Failure to note the real structural framework of modes can lead to even greater misinterpretations, as is the case of constructing the scale of *makam segah* from a *hicaz* tetrachord based on *ırak* (f♯) (Ezgi 1953 vol. 5: 230). A tetrachord on *ırak* is inconceivable in *segah*, because *ırak* is an unstable leading note to the tonal axis *rast* (g). The wholesale use of tetrachords results also in strange views about the character or the mood of the modes. I once heard from a prominent Turkish musician that *hüzzam* is more sad than *hicaz*, because it is made from the combination of *segah* (which also has a "chromatic" tetrachord . . .) and *hicaz*. The point is still debatable, because the character of *hüzzam* is so difficult to pinpoint, yet in my opinion *segah* is sweet, calm and mild rather than sad, and *hüzzam* is a *makam* contrasting with *hicaz* rather than an intensification of it.

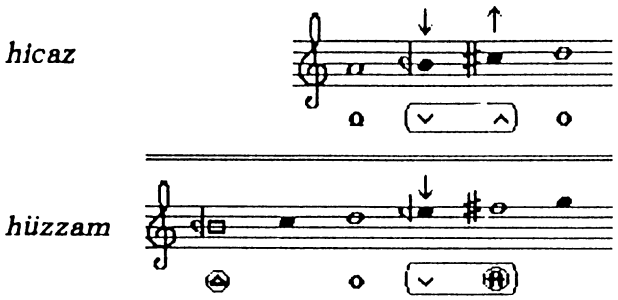
3. The "enharmonic" species

The characterization of the third *ichos* and its *plagios* as "enharmonic" is due only to the fact that the leading notes to the first and fourth degrees are often intoned very close to those degrees, so that theorists were able to claim the resulting small intervals as the quartertones of the ancient enharmonic species, though in fact these modes bear no relation to the ancient enharmonic species. A recording[2] of Iakovos Navpliotis, Protopsaltis of the Patriarchate during the first decades of this century, exemplifies clearly this type of intonation of leading notes in the third mode. Such "quartertones" appear not only in the third modes, but also in several variants of the first plagal mode (in *hüseini*—between *hüseini* and *acem aşiran*, and in *acem kürdi protos pentafonos*). Furthermore, they can also be used in many other places where the attraction of the leading tone to the main tonal center is very strong, as in the plagal fourth mode (*rast*), or in chromatic modes like *varys chromatikos eptafonos* (*eviç ara*) etc. Besides the *pthorai "nana"* and *"nenano"*, which stand out due to the remarkable effect of the leading tones they introduce, there are two obsolete signs, *imiphonon* and *imifthoron*, whose meaning is unknown, but which may have indicated such leading notes, as both theory and usage suggest.

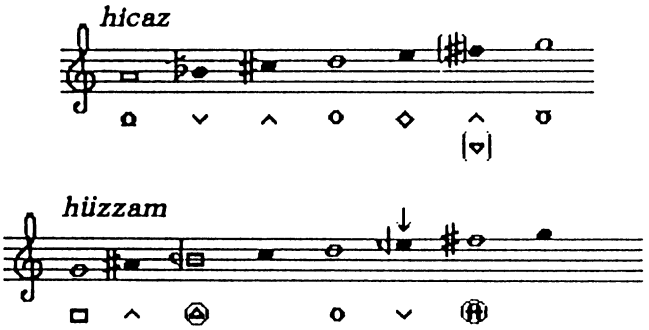
Conclusion

The shortcomings of modern Greek and Turkish theory become clear when compared to each other, to older theory, and to practice. While most music students in Greece and Turkey only learn the newer theory, it might be inspiring, even for the practicing musician, to come in contact with the older theoretical tradition. I have tried to show that the Greek and Turkish musical theoretical traditions acquire new meaning in the light of the results of modern research on Near Eastern modal music. The old theoretical concepts are a key to understanding not only the structure and development of the modal systems during their long history, but also the nature of Near Eastern modal music. The techniques for describing, notating and teaching modal music that are part of these theoretical

traditions show a remarkable coherence and resilience over time. It is natural to regard them as being almost "innate" to the music itself, and to look to them for hints about how to describe, analyze and understand the music.



a) The central tonal spaces of *hicaz* and *hüzzam*.
The framework of hicaz is the fourth a-d'. The two middle degrees are unstable "leading notes". In hüzzam the thirds prevail. The most characteristic note is the lowered e', which is somewhere between the tone and the semitone.



b) The scales of hicaz and hüzzam, with functional notation added.
Symbols:

On the stave: ○ = central tone, axis □ = final tone • = secondary degree
Below the stave:
○ = central tone
▽ △ = axis at the fourth above / below the central tone(tetrachord-axis)
▽ △ = " " " minor third " " " " "
⊕ ⊕ = " " " major third " " " " "
□ = " " " fifth . below " " "
∨ ∧ = unstable leading notes downwards and upwards

Figure 8:
The structure of the tonal spaces of *deuteros (hüzzam)* and *plagios deuteros (hicaz)*

NOTES

1. Small bridges, the lowering or raising of which results in a minute adjustment of the string's pitch.
2. Recording of Iakovos Navpliotis, Protopsaltis (first Singer) of the Patriarchate, made by Orpheon records at the beginning of the 20th century, number of record unknown. The piece is a "Allilouia" in the third mode, sung by Iakovos Protopsaltis and Konstantinos Pringos.

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